

IMPORTANT FOR INTERVIEW

SQL TOPICS

INDEXES, STORED PROCEDURES, TRANSACTIONS,
NORMALIZATION, VIEWS

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INDEXES

- **Clustered Index:** Sorts and stores data rows in the table (only one per table).
- **Non-Clustered Index:** Separate structure pointing to data rows (multiple allowed).
- **Composite Index:** Index on multiple columns for multi-column search.
- **Performance:** Too many indexes slow writes; best for frequently searched columns.

STORED PROCEDURES, FUNCTIONS & TRIGGERS

- **Procedure:** Can return multiple values, supports transactions, used for business logic.
- **Function:** Returns single value or table, can be used in SELECT, no transactions.
- **Triggers:** Automatically run on events (Insert/Update/delete). Useful for auditing & rules.

TRANSACTIONS & CONCURRENCY

- **ACID Properties:** Atomicity, Consistency, Isolation, Durability.
- **Isolation Levels:** Read Uncommitted, Read Committed, Repeatable Read, Serializable.
- **Deadlocks:** Occur when transactions wait for each other. Avoid by short transactions, consistent resource order.

NORMALIZATION & DENORMALIZATION

- **1NF**: Atomic values, no repeating groups.
- **2NF**: No partial dependency on composite key.
- **3NF**: No transitive dependency (non-key depends on non-key).
- **BCNF**: Stronger 3NF; every determinant must be a candidate key.
- **Denormalization**: Used for performance (fewer joins in reporting).

VIEWS & MATERIALIZED VIEWS

- **Views:** Virtual tables, do not store data physically.
- **Advantages:** Simplify queries, improve security.
- **Materialized Views:** Store data physically, faster for complex queries but need refresh.
- **Indexed Views:** Persisted with indexes, useful for performance in reporting/analytics.